Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please amend claims 1-23, 25, 27, 29, 33, and 35-40 as follows:

1. (currently amended): A receiver system configured to receive digitally modulated signals for use in a communications system ~~comprising:~~ employing a transmitter configured to transmit digitally modulated signals operating in a band of frequencies that is divided into two or more non-overlapping channels, with each channel occupying no more than a predetermined maximum frequency band[[;]], ~~a receiver system configured to receive the digitally modulated signals,~~ the receiver system comprising:

one or more analog to digital converters (ADCs), the number of ADCs being less than the number of non-overlapping channels, the one or more ADCs being configured to convert the entire band containing two or more non-overlapping channels to a digital data stream sampled at a rate of at least twice the highest frequency within the band;

a front end processor configured to receive the data stream and to down-convert to baseband and decimate this data stream to produce an output data stream that represents each channel within the band, with samples for each channel within the band at a rate that is a multiple of the symbol rate for the given channel; and

a receiver containing an indexer configured to operate on the output data stream, sequencing through the multiple channels so that data, including phase state, time state,

and equalizer state, related to each channel is processed in sequence to phase correct, time correct, and equalize the data stream for all the constituent channels.

2. (currently amended): The ~~communications~~ receiver system of claim 1 wherein the communications system is a cable television (CATV) system wherein the digitally modulated signals are upstream communications through a coaxial cable from a subscriber to a headend where the receiver system resides.

3. (currently amended): The receiver ~~communications~~ system of claim 2 wherein the digitally modulated signals are data over cable service interface specification (DOCSIS) compatible signals.

4. (currently amended): The receiver ~~communications~~ system of claim 2 further comprising mini-headends each separately containing a receiver system configured like said receiver system connected to subscribers through coaxial cables less than three miles in length and connected to data network through optical fiber.

5. (currently amended): The receiver ~~communications~~ system of claim 4 wherein the band range from approximately 6.4 MHz to 44.8MHz with the non-overlapping channels having bandwidths of approximately 3.2MHz, 1.6 MHz, .8 MHz, .4 MHz, or .2 MHz and the channels are organized into 3.2 MHz wide group channels that have flexibly selected center frequencies at 4.8 + ~~3.2(N) MHz~~3.2*N MHz, ~~(where N=1, 2, 3… 11)~~where N=1, 2, 3… 11.

6. (currently amended): The receiver ~~communications~~ system of claim 2 wherein the receiver further comprises:

an input for receiving a data stream representative of the entire band, with each channel within the band converted to baseband and sampled at a rate of at least twice the symbol rate of the related channel;

an equalizer configured to equalize the data for each of the constituent channels;

a timing recovery circuit configured to recover timing information for each of the constituent channels; and

a phase recovery circuit configured to recover phase information for each of the constituent channels~~; and~~, wherein the ~~an~~ indexer ~~that~~ controls the cycling data through the equalizer, the timing recovery, and phase recovery circuits so that data related to each channel is processed by each of the components in sequence, thereby requiring only one phase recovery, one timing recovery and one equalization circuit for all the channels within the multi-channel band.

7. (currently amended): The receiver ~~communications~~ system of claim 6 wherein the receiver further comprises:

data memory configured to store data for each of the constituent channels separately.

8. (currently amended): The receiver ~~communications~~ system of claim 7 wherein the data memory is configured as a circular buffer.

9. (currently amended): The receiver ~~communications~~ system of claim 8 wherein the data memory is configured as a two-way circular buffer, with data extracted from the buffer in one loop at a rate "CLK" and data written to channel-related divisions of the buffer at rates that total the rate CLK at which data is extracted from the buffer.

10. (currently amended): The receiver ~~communications~~ system of claim 9 wherein the rate at which data is written to each channel-related division of the buffer is equal to the rate at which data is extracted from the buffer multiplied by the ratio of storage area devoted to the channel compared to the total storage area of the data memory dedicated to storing channel data.

11. (currently amended): The receiver ~~communications~~ system of claim ~~6~~ 7 wherein the indexer comprises an index vector that provides an indication of which channel is related to data in each of the data memory locations dedicated to storing channel data.

12. (currently amended): The receiver ~~communications~~ system of claim 9 wherein the rate CLK is equal to the total sampled data rate of the entire communications band.

13. (currently amended): The receiver ~~communications~~ system of claim 6 further comprising:

a receiver front end, the front end comprising;

a down-converter configured to accept a data stream data stream comprising samples of the entire band sampled at a rate of at least twice the frequency of the highest frequency in the band and to convert the component channel signals within the band to baseband; and

a decimator configured to decimate a down-converted signal received from the down-converter.

14. (currently amended): The receiver ~~communications~~ system of claim 13 further comprising a plurality of down-converters configured to down convert to baseband the component channels within the band in parallel.

15. (currently amended): The receiver ~~communications~~ system of claim 14 further comprising a decimator configured to receive the baseband channel signals from a corresponding one of the down-converters and to decimate the corresponding baseband channel signal to a digital data stream having two samples for each symbol period of the respective channel.

16. (currently amended): The receiver ~~communications~~ system of claim 15 wherein the front end is configured to down-convert and decimate a data over cable service interface specification (DOCSIS) data stream comprising digitally modulated signals that fall within non-overlapping upstream channels that are assigned within a 5 to 42 MHz band.

17. (currently amended): The receiver ~~communications~~ system of claim 15 wherein the front end is configured to down-convert and decimate a data stream in which non-overlapping channels are assigned bandwidths of approximately 3.2MHz, 1.6 MHz, .8 MHz, .4MHz, or .2 MHz.

18. (currently amended): The receiver ~~communications~~ system of claim 13 further comprising a plurality of down-converters arranged in a tree-structure to iteratively convert to baseband successively smaller portions of the frequency band.

19. (currently amended): The receiver ~~communications~~ system of claim 18 wherein the down-converters are configured to iteratively convert to baseband smaller portions of the frequency band until each channel within the band is converted to baseband.

20. (currently amended): The receiver ~~communications~~ system of claim 18 further comprising decimators configured to decimate the successively smaller portions of the frequency band.

21. (currently amended): The receiver ~~communications~~ system of claim 20 wherein the decimators are configured to decimate each baseband channel to a sample rate that is twice the symbol rate of the baseband channel.

22. (currently amended): The receiver ~~communications~~ system of claim 13 further comprising an analog to digital converter (ADC) configured to receive the full-band analog signal, to sample the entire band at greater than twice highest frequency of the band and to provide the sampled data to the down-converter.

23. (currently amended): A method of providing communications comprising the steps of:

(A) transmitting digitally modulated signals operating in a band of frequencies that is divided into two or more non-overlapping channels, with each channel occupying no more than a predetermined maximum frequency band;

(B) receiving the digitally modulated signals;

(C) employing one or more analog to digital converters (ADCs), the number of ADCs being less than the number of non-overlapping channels[[.]] to convert the entire band to a digital data stream sampled at a rate of at least twice the highest frequency within the band;

(D) receiving the data stream from the one or more ADCs and down-converting to baseband the data stream;

(E) decimating the data stream to produce an output data stream that represents each channel within the band, with samples for each channel within the band at a rate that is a multiple of the symbol rate for the given channel; and

(F) sequencing through the multiple channels to phase correct, time correct, and equalize the data stream for all the constituent channels.

24. (original): The method of claim 23 wherein the digitally modulated signals are upstream communications through a coaxial cable from a subscriber to a headend where the receiver system resides in a cable television system.

25. (currently amended): The method of claim 23 wherein the digitally modulated signals are data over cable service interface specification (DOCSIS) compatible signals.

26. (original): The method of claim 23 further comprising the step of

(G) transmitting signals from a subscriber to a receiver system located in a mini headend the receiver system connected to subscribers through coaxial cables less than three miles in length; and

(H) transmitting the demodulated signals from the receiver system through an optical fiber to a central headend.

27. (currently amended): The method of claim 26 wherein the band ranges from approximately 6.4 MHz to 44.8MHz with the non-overlapping channels having bandwidths of approximately 3.2MHz, 1.6 MHz, .8 MHz, .4 MHz, or .2 MHz and the channels are organized into 3.2 MHz wide group channels that have flexibly selected center frequencies at 4.8 + ~~3.2(N) MHz (where N=1, 2, 3... 11)~~3.2*N MHz, where N=1, 2, 3… 11.

28. (canceled):

29. (currently amended): The method of claim ~~28~~ 41 further comprising the step of:

(N) storing data for each of the constituent channels in separate areas of data memory.

30. (original): The method of claim 29 comprising the step of:

(N1) storing the data in data memory configured as a circular buffer.

31. (original): The method of claim 30 comprising the step of:

(N2) storing the data in data memory configured as a two-way circular buffer whereby with data extracted from the buffer in one loop at a rate "CLK" and data is written to channel-related divisions of the buffer at rates that total the rate CLK at which data is extracted from the buffer.

32. (original): The method of claim 31 wherein the rate at which data is written to each channel related division of the buffer is equal to the rate at which data is extracted from the buffer multiplied by the ratio of storage area devoted to the channel compared to the total storage area of the data memory dedicated to storing channel data.

33. (currently amended): The method of claim ~~28~~ 41 further comprising the step of:

(El) the indexer providing an indication of which channel is related to data in each of the data memory locations dedicated to storing channel data.

34. (original): The method of claim 31 wherein the rate CLK at which data is extracted from the data memory is equal to the total sampled data rate of the entire communications band.

35. (currently amended): The method of claim ~~28~~ 41 further comprising the ~~steps~~ step of:

(O) down-converting and decimating digitally modulated signals operating in a band that is divided into two or more non-overlapping channels, with each channel occupying no more than a predetermined maximum frequency band.

36. (currently amended): The method of claim ~~25~~ 35 wherein step (O) further comprises the steps of;

(O1) a down-converter accepting a data stream comprising samples of the entire band sampled at a rate of at least twice the frequency of the highest frequency in the band;

(O2) the down-converter converting the component channel signals within the band to baseband; and

(O3) a decimator decimating the down-converted signal received from the down-converter.

37. (currently amended): The method of claim 36 wherein the step (~~G2~~O2) of down-converting further comprises the step of:

(O2a) a plurality of down-converters down-converting to baseband the component channels within the band in parallel.

38. (currently amended): The method of claim 36 wherein the step (~~G3~~O3) of decimating further comprising the step of:

(O3a) a decimator receiving the baseband channel signal from a corresponding one of the down-converters decimating the corresponding baseband channel signal to a digital data stream having two samples for each symbol period of the respective channel.

~~40~~39. (currently amended): The method of claim 36 wherein the step (O2) of down-converting further comprises the step of:

(O2b) a plurality of down-converters arranged in a tree-structure iteratively converting to baseband successively smaller portions of the frequency band.

~~41~~40. (currently amended): The method of claim ~~40~~ 39 wherein the step (O2b) further comprises the step of:

(O2c) the down-converters iteratively converting to baseband smaller portions of the frequency band until each channel within the band is converted to baseband.

41. (new): A method of providing communications comprising the steps of:

(A) transmitting digitally modulated signals operating in a band of frequencies that is divided into two or more non-overlapping channels, with each channel occupying no more than a predetermined maximum frequency band;

(B) receiving the digitally modulated signals;

(C) employing one or more analog to digital converters (ADCs), the number of ADCs being less than the number of non-overlapping channels to convert the entire band to a digital data stream sampled at a rate of at least twice the highest frequency within the band;

(D) receiving the data stream from the one or more ADCs and down-converting to baseband the data stream;

(E) decimating the data stream to produce an output data stream that represents each channel within the band, with samples for each channel within the band at a rate that is a multiple of the symbol rate for the given channel;

(F) sequencing through the multiple channels to phase correct, time correct, and equalize the data stream for all the constituent channels;

(I) receiving at an input the data stream representative of the entire band, with each channel within the band converted to baseband and sampled at a rate of at least twice the symbol rate of the related channel;

(J) equalizing the data for each of the constituent channels in an equalizer circuit;

(K) recovering timing information for each of the constituent channels in a timing recovery circuit;

(L) recovering phase information for each of the constituent channels in a phase recovery circuit; and

(M) indexing the cycling of data through the equalizer, the timing recovery, and phase recovery circuits so that data related to each channel is processed by each of the components in sequence, thereby requiring only one phase recovery, one timing recovery and one equalization circuit for all the channels within the multi-channel band.